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THE OSTEOLOGY OF A DOUBLE-HEADED CALF

THROUGH the kindness of Mr. Charles O. Reed, taxidermist, of Fairmont, W. Va., the writer received the skulls and anterior cervical vertebræ of a double-headed calf which seemed of sufficient interest to warrant a brief description.

According to Mr. Reed the calf's mother was a four-year-old, thoroughbred Herford, living at Grafton, W. Va., owner not mentioned.

At her first labor this cow gave birth to twins, supposedly normal, though it was not so stated. The second calf was "slightly deformed," but in what way Reed did not know. The third labor produced the double-headed calf in question, which was of unusual size, and was killed in parturition. According to Reed "This calf would have lived if it could have been brought through O. K." He dissected it and found the "alimentary canal, blood vessels and trachea normal."

The bones in the occipital region are slightly broken, probably done in disarticulating the skulls from the neck; and in the left skull the left premaxilla was lost and was replaced by a roughly carved piece of wood for the sake of symmetry.

In macerating the skulls, for the purpose of removing all the flesh, many of the loose sutures separated, and in gluing the bones together again it was not always possible to completely close the sutures.

As may be seen in the figures there is a considerable though not very great difference in the size of the skulls, the right being the larger. They were detached from the cervical vertebræ when received, but the photographs show their approximate position in relation to the neck and to each other.

Each skull is twisted and bent away from the other, the bend being most marked just cephalad to the orbits. The left skull is the more distorted.

The articulation of the skulls with the fused atlas was so crude that Reed, who had seen the skulls before disarticulation, had to be appealed to to decide which skull was right and which was left.

Fig. 1 is a photograph of the dorsal aspect of the skulls and the first three cervical vertebræ. The distortion of the two skulls is of about the same character but is, as noted above, more marked in the left skull.

The parietal (*p*) is normal. The posterior regions of the frontals (*f*) are normal, but their anterior ends are bent laterally, which causes a slight curvature in the sagittal suture. It is in the region of the lachrymals (1) that the distortion is most marked, so that the lachrymal on the convex side of the bend, especially in the left skull, is much longer than that on the opposite side; the same is true of the malars (*m*), of the maxillaries (*mx*), and, to a less degree, of the premaxillæ (*pm*). The nasals (*n*) are also unsymmetrical, but do not differ much in size; they are simply, as a pair, pushed to the side.

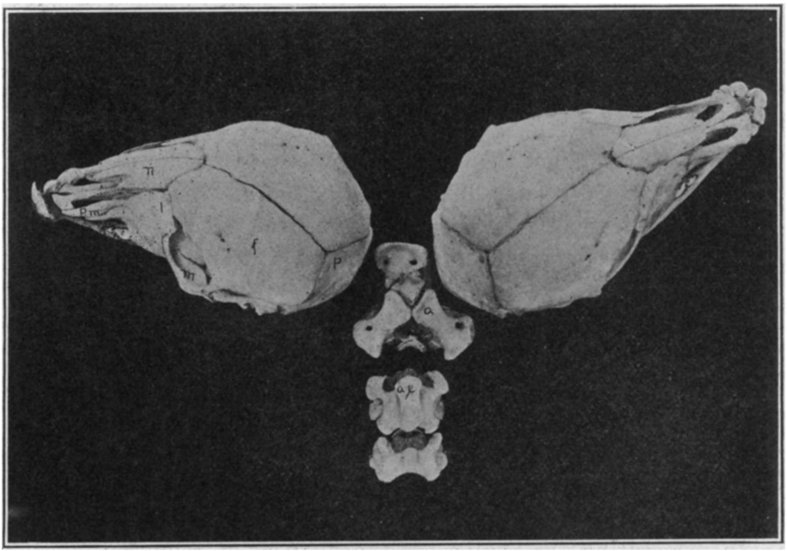

FIG. 1. DORSAL VIEWS OF THE TWO SKULLS AND OF THE FIRST THREE CERVICAL VERTEBRÆ. MANDIBLES IN POSITION.

a, atlas; *ax*, axis; *e*, extra bone between maxilla and premaxilla; *f*, frontal; *l*, lachrymal; *m*, malar; *mx*, maxilla; *n*, nasal; *o*, occipital; *p*, parietal; *pm*, premaxilla.

Fig. 2. The ventral aspect of the skull shows even greater abnormalities than the dorsal. The occipital (*o*), as noted above, was somewhat injured by the person who disarticulated the skulls from the neck, but it is quite unsymmetrical, especially in its exoccipital region. In the left skull (right in this figure) all the other bones seen in this aspect are bent, but in the other skull most of the bones are comparatively straight.

In the right skull a suture in front of the teeth separates off an extra bone (*e*) on each side, between the maxilla and the premaxilla, that of the right side being much the larger. In the left skull these extra bones are not present though a partial suture, extending about half way through the left maxilla, is visible in this view of the skull.

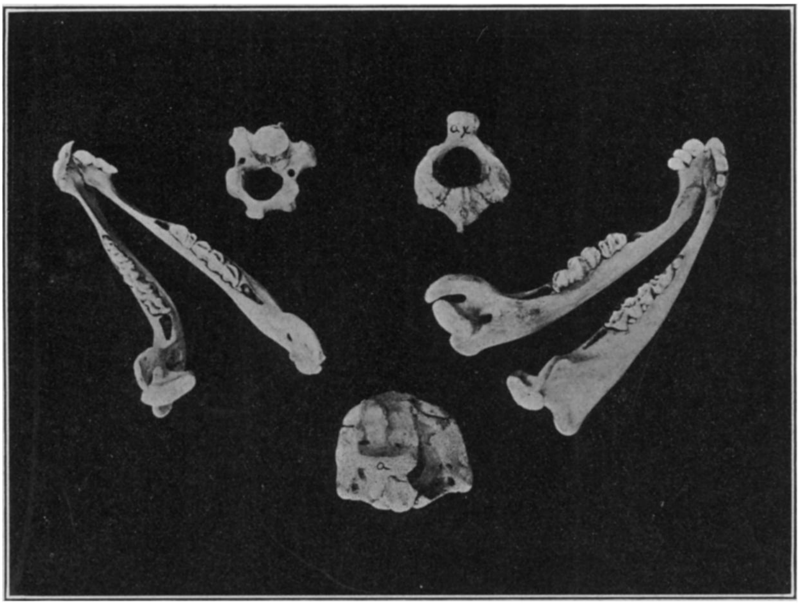

FIG. 2. VENTRAL VIEWS OF THE SKULLS AND THE FIRST TWO CERVICAL VERTEBRÆ. MANDIBLES REMOVED.

Fig. 3 shows the curious distortion of the mandibles, which seem to be bent in more or less the same direction. In the right mandible the left half has four incisor teeth, the right half has three. In the left mandible the right half has four teeth, the left half has three, though one tooth is missing from each half.

As noted above, the skulls, when received, were disconnected from the vertebræ; but the latter, three in number, were strung together on a small piece of rope and presumably were the first three cervicals; they are shown in a dorsal view in Fig. 1, ventral view in Fig. 2, and anterior view in Fig. 3. The first of these is presumably a compound atlas (*a*) since it articulates with each of the skulls, though in a very crude way. It consists of eight loosely united elements which became completely separated in cleaning and had to be glued together again. In the dorsal view, Fig. 1, is seen a small, irregular bone from which radiate three somewhat symmetrical bones, the largest lying in the median plane between the bases of the skulls. This larger bone is pierced by two large foramina; each of the other two bones shows in this view a foramen which branches and opens both on the antero-median and the postero-lateral surfaces. The ventral view, Fig. 2, shows a very irregular group of bones, the smallest of which is for articulation with the following vertebra.

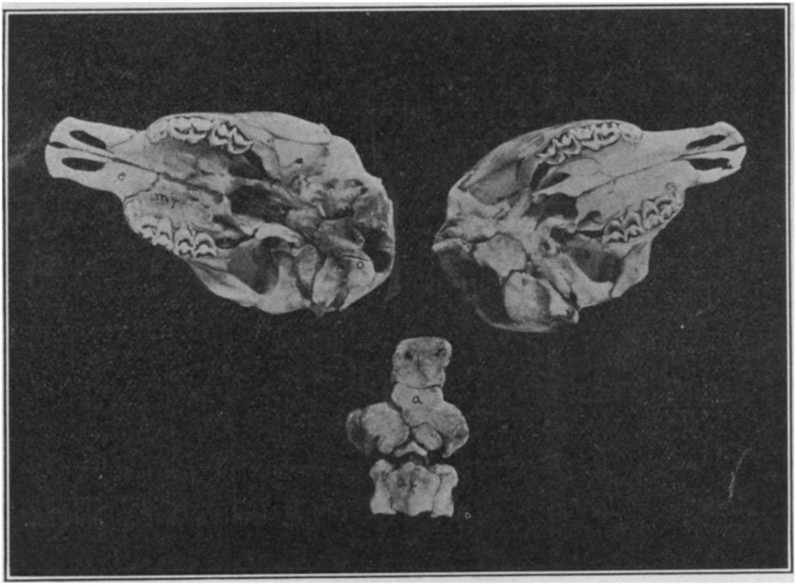

FIG. 3. DORSAL VIEWS OF THE MANDIBLES AND ANTERIOR VIEWS OF THE FIRST THREE CERVICAL VERTEBRÆ.

The second vertebra (*ax*), supposedly the axis, exhibits no indication of an odontoid process and articulates in a very crude way with the preceding bone. Its dorsal spine is rather elongated in an antero-posterior direction, but otherwise it bears no closer resemblance to an axis than to any other cervical vertebra. Its centrum was so loosely fused with the arch on either side it became detached in cleaning and had to be glued in place.

The third vertebra exhibits no peculiarities that warrant description.

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